LM-280

AUTO LENSMETER

USER'S MANUAL

Introduction

This manual mainly introduces how to correctly use LM-280 Auto Lensmeter . In order to operate it more safely and effectively , please read this manual carefully before you use this machine.

Surely , if you find any mistake or problem in this manual please do not hesitate to contact Shanghai Yanke Equipment Co., Ltd.

LM-280 Auto Lensmeter is applied to measure the top focus degree and prism degree of eye-glass lens and cornea Screen lens, orient the axial direction of prism, locate and mark the center and axis of the rough lens. It can also be used to check whether the glass is installed properly and test the penetration ratio of purple light.

LM-280 Auto Lensmeter can be used for not only monochromatic lens, but also twin focus lens, three focuses lens, progressive multi focus lens and contact lens.

LM-280 Auto Lensmeter is digital-show focus degree instrument made according to the theory of auto-focus. Its resolving power is 0.01 m^{-1}.

LM-280 Auto Lensmeter is far more favorable in the function and Test Step contrasted to manual focus instrument.

LM-280 Auto Lensmeter is the first-degree focus apparatus, based on the Enterprise Standard of NWLK01-2004.

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Chapter 1 Safety Measures and Cautions

The safety contents are defined as different signs in these instructions as follows:

⚠ **Danger:** indicate the emergent situations, if not avoid, death or grievous harm will happen.

⚠ **Warning:** indicate the potential dangerous situations, if not avoid, death or grievous harm may happen.

⚠ **Caution:** indicate the potential dangerous situations, if not avoid, light harm or farther harm may happen or the property of instrument may be influenced.

A. Operation Cautions:

⚠ Caution:

- Not open and touch the inside without permission, otherwise electric shock or instrument exception will happen
- Please apply the stated power supply voltage. The voltage can’ t be too low or high, otherwise apparatus can not run normally, even damage the instrument and cause to electric shock.
- Power supply lines under the instrument is not permitted, otherwise the surface layer of the line will be damaged and the followed accident will be caused: short circuit , fire and electric shock.

  If the metal core of the Power supply line is exposed, it must be changed in order to avoid electric shock and fire.

B. Deposit Cautions:

Hints:

- Don’t locate the instrument near the poisonous, erosive liquid and gas.
- It is not permitted to expose the instrument under the sunlight and keep proper temperature and humidity.

Move Cautions:

⚠ **Warning:**

- Pulling the instrument lines and cables forcibly is forbidden, otherwise instrument damage and personal harm may happen;
- Don’t move the whole instrument by catching the framework, the permissive method is to support the base with hands in the back when moved, otherwise it may cause man hurt or instrument damage.

C. Installation Cautions:

⚠ **Warning:**

- Don’t locate the instrument near wet place. If water enters it will cause electric shock and instrument faults.
- Please install the instrument firm and flatly. Body harm and instrument damage will happen because of instrument fall when improperly fixed.

Hints:

- Don’t locate the instrument under the sunlight or use it beside the lamp; The surface such as mirror, glass show-case or polished table which reflect the light intensively is not suitable to fix the instrument, otherwise the instrument may work improperly.
- Don’t use the instrument in the place exposed in the wind of the

fans and air conditioner, otherwise dust will enter into the base and the Step will be influenced.

- Don’t use the instrument under the circumstances of web, heat and dust. They will be bad for the instrument.

Connection Cautions

⚠ **Warning:**

- Don’t plug excessive pin into one socket, otherwise fire will be caused.

D. Cautions After Use

⚠ **Warning:**

- Please turn off the power supply when finished and put on the dust-proof cover. If power is on for over long time the fire may be caused because of overheat. The dust may influence the Test Step if exposed over long time without cover.
- Please pull out the power line against fire if the instrument is free for long time.

E. Maintain Cautions

⚠ **Warning:**

- When adding ink, please pull out the ink box lightly and put it flatly on the table lest the print center hurt your fingers.

Hints:

- If your instrument is in exception and need to open for repair, please contact with our agent. We will be derelict of duty if it open by yourself.
- Please do mind not to scratch the surface protect lens under the base. The nick will reduce the Step and reliability of Test.

F. Contingency Cautions:

⚠ **Warning:**

- In case of LCD screen destroyed, please smash it into fragments and clear off the Liquid Crystal with iso-propyl alcohol and burn them off.
- When contact the Liquid Crystal left, please water off as soon as possible.

Chapter 2 Label Instruction

To guarantee safe operation, this instrument is with a label on the back. Please use the power supply according to the instruction and replace fuse.

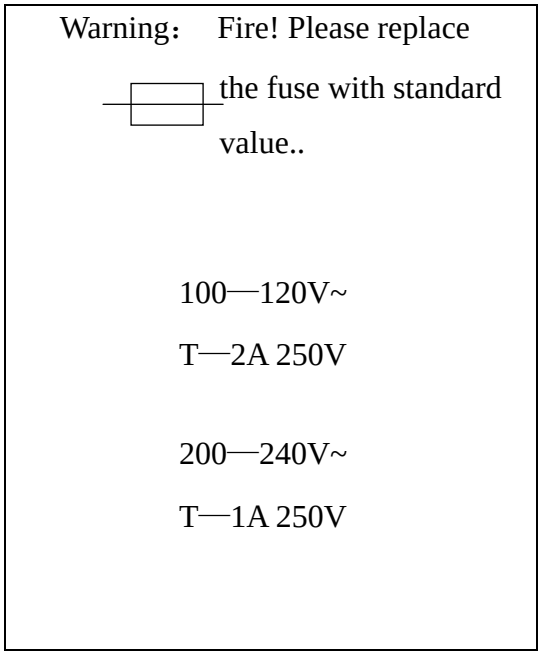
A: Signs on the instrument

⚠ Read carefully before use。

0 Signs “ on/off” of power supply

| Power off

Fuse sign and standard value



Fuse Parameters is on the lower label of the back

B: Main Technology Parameters

1. Test scope

   Ball lens: 0~±20D (Reading Increment 0.01D, 0.12D, 0.25D)

   Column lens: 0~±9.99D (Reading Increment 0.01D, 0.12D, 0.25D)

   Ball lens axial position: 0~180°（Reading Increment 1°）

   Prism: 0~9.99△ (Reading Increment 0.01△,0.12△,0.25△)

   (ADD): 0~9.99D (Reading Increment 0.01D, 0.12D, 0.25D)

2. Astigmatic Test Mode: MIX /+/—

3. Prism Test Mode:

X—Y: Cartesian Coordinates

P—B: Polar Coordinates △

mm: mm expression

4. Reading resolving power: $0.01m^{-1}$
5. Multi-beam type: double-beam, progressive multi focus.
6. High Refraction ratio Lens Compensation: ABBE value 30-60
7. Display: LCD
8. Diameter of Compatible Lens: 10mm-90mm
9. Power Supply: AC 220V 50Hz or AC 110V 60Hz
10. Max Power: 55W
11. Weight: 7KG
12. Outline Size: 200（W）x 290（D）x 450（H）mm
13. Optional Accessories:

P. Thermal Printer

Chapter 3 Using The Instrument

3.1 Names of out elements and parts

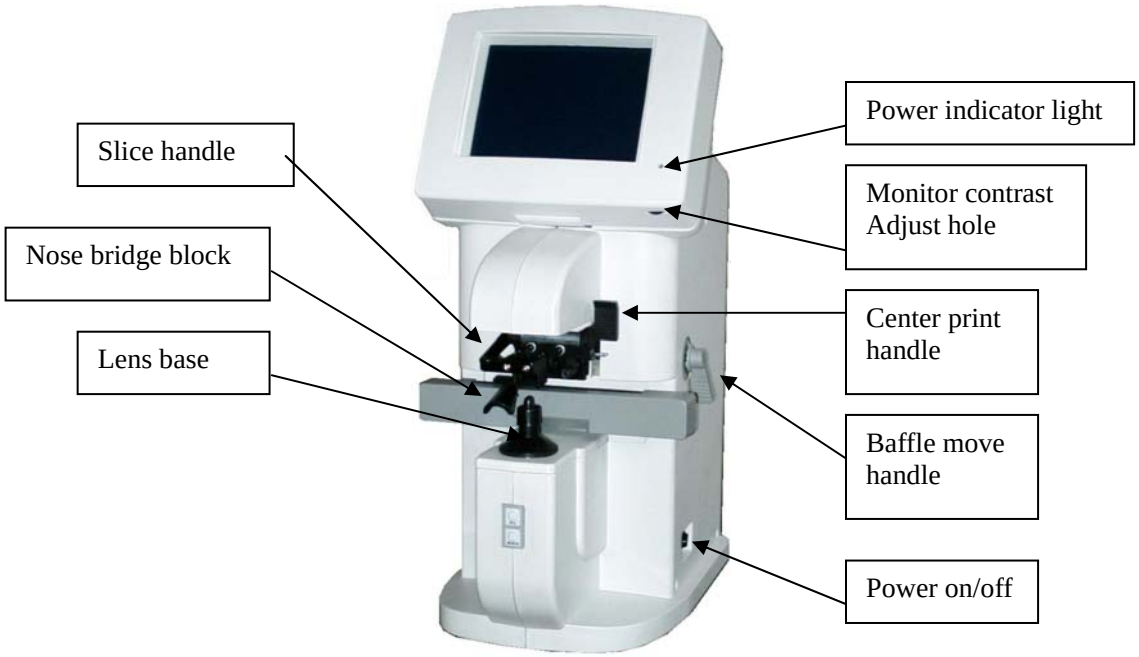


Fig. 1. LM-280 Auto Lensmeter Outline

LM-280 Auto Lensmeter Outline showed as Fig. 1, Names of the elements and parts as follows:

3.2 INSTALLATION AND OPERATION

1.Preparation

a)To install the instrument on the table with no sunlight and intensive reflection, avoiding heat, wet and dust.

b) To get rid of the sub of center print ink box.

c) To pull up the cushion handle to get rid of the dust-proof cushion.

pull the handle and the framework is settled on the top, repeat the operation and the framework set down on the bottom.

d) To collect and check all accessories, documents and put them to right place of the tool box.

e) To check the power supply and make it satisfied with the instrument, then plug the two ends into the instrument and socket respectively.

f) To turn on the power

"Initial " Screen (Fig.2) is showed; soon it will convert to Screen 1 (Fig. 3)

> **Attention:** if put the lens on the bracket before opening the power, the instrument will not convert to Test Screen after the "open" Screen but to display the hint " INITAI ERROR" under the Screen, please take away with the lens and reopen the power.

2.Screen and Menu

A. Initial Screen

Turn on the AUTO LENSMETER, the "Initial" Screen is showed on the display

B. Test Screen

The Test Screen 1 is displayed automatically after the "Initial" Screen (Fig. 3).

Fig. 3 Test Screen

The Test can be made both under the state of Screen 1 and Screen 2.

> ● Operation key is under the control Screen of display. Don't press the function indicator on the LCD, otherwise the display will be damaged.

C. Menu Screen

The choices of Test, object, method and unit parameters etc. are made through the Menu Screen. When press the ":Menu" key, the target Screen is displayed (Fig.4).

Once the move-up (move-down) key is pressed, the selected parameter will move up (or down) one line. Now press the move-up or move-down key, the favorable option is available. The selected option on the Screen is marked with white beam and up-towards arrow. When the selection is finished, return to the Test Screen.

STEP 0.25, 0.12, 0.01
CYL + , +/- , -
PRISM OFF , X-Y , P-B
LENS NORMAL, CONTACT LENS
SAVE OFF , 5, 10, 30, 60(min)
MEMORY OFF , + , +
ABBE 60 , 50 , 40 , 30
TIME 2005, 11, 12 14:36
LANGUAGE CHINESE, ENGLISH
EXIT

Fig.4 Menu Screen

Each parameter option is given as (table 1) shows:

Table 1. Parameters options

Parameters	Options
Step	0.01D, 0.12D, 0.25D
Pole lens	Mixture, +, -
Len	Normal, Contact Lens
Prism	Not display, X-Y, P-B
Save	Close, 5 min, 10 min, 30 min, 60 min,
Auto-memory	Close, Near center, Aim at center
ABBE Constant	60, 50, 40, 30,
Time	2005.06.23 05:24
Language	Chinese,English

3.3 Measuring

Caution: Please read the introduction closely, be familiar with function, operation of every element and corresponding instructions before use.

A. Test single beam lens

1. Stop the cushion framework on the top and put the convexity of the lens on the bracket upward, hold the lens by hand and raise the cushion slowly to the top to fix the lens.
2. Move lens and when the lens is close to the drone, the “0” type drone will be show on the display. When optical center is parallel with drone, the horizontal line will become longer and the cursor will display the hint “MARKING OK” .Then you can get the data from it.
3. Press “MEMORY” if you want to save the data ,then “S” will be showed with contrast color. If printing is necessary, please press “PRINT”, otherwise press “CLEAR”.
4. Identify left lens or right lens

   Press the left lens key or right, then “L” appears on the top of left side or “R” on the top of right side of Test Screen.

   If it is not requested to identify left and right lens, then “S” will appear on the right top of the Screen.

B. Put the lens with eyeglass framework

1) ensure the lens left or right as the same way.

2) put lens

put the lens on the bracket with the convexity of the lens upward and the top

of the framework towards the operator.

3) adjust lens baffle

make the baffle close to bottom of the framework by moving the baffle handle.

4) Fix lens

press the lens by cushion framework

Attention: the state will be kept when the instrument be reopened after Screen check and option.

C. **Check lens**

Make options of Step, prism, auto-memory before measure lens. The Step of 0.01D, 0.12D, 0.25D represents different resolving capacity. Four options of prism represent respectively as follows:

Close…… not display

X-Y…… Cartesian Coordinates

P-B …… Polar Coordinates

Three items of auto-memory option will be explain later.

A. Check single beam lens

Move lens and when the lens is close to the drone, the “0” type drone will be show on the display. When optical center is parallel with drone, the horizontal line will become longer and the cursor will display the hint “MARKING OK”. At the same time the sound “beep” will be heard and all parameters checked will be displayed and the “L” “R” “S” will be showed with contrast color.

To auto-memory, the hint sound “close to center” is easy to operate but the Step is low; while “ in center” is with high Step but require more Caution and care. Operator can choose mode as he likes

Attention: if data is saved, the lens must be taken away before the next Test, press clear key. The lens can be put on the bracket for new Test only after the data is cleared

. If the option “ Auto-memory” is closed, the cross line is drawn longer but the hint sound will not be heard when the lens optical center is close to the drone. It has the same Step with optical center focus. Press the auto-memory key and then the data can be latched by

manual.

Fig. 7 and Fig. 8 show the second Screen during the Test, and Fig. 9 is Screen after the operation is finished.

Fig.5Start Screen of Test

Fig6.opticalcenter is close to the Screen

Fig.7. Final Screen of Test

B. Check lens with framework

Lens fix method is same with A,1, while measure method is same with B,2 for single beam lens, here the lens position can be changed by moving framework.

C. Measuring two beams lens

1) Put the lens on the bracket with the convexity side to the far-sighted part. (Fig.8)

2) Measure the parameters of far-sighted part with the same

method for single beam lens .

3) Press the memory key under the bracket to confirm and record the measured parameter of far-sighted part

4) Press “ADD” function key as displayed on Fig. 11

5) Draw the lens outward and move properly to make the myopic part on the center of the bracket (Fig. 12), the result of ADD will be showed on the displayed. (Fig. 13)

6) Repress the memory key to save the data.

Hints: fine focus is not required when test ADD value. But the sub-lens must be in scope of penetration hole of lens bracket.

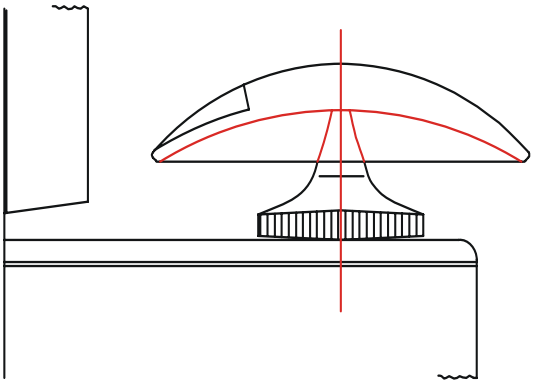


Fig. 8 installation of the far-sighted beam lens

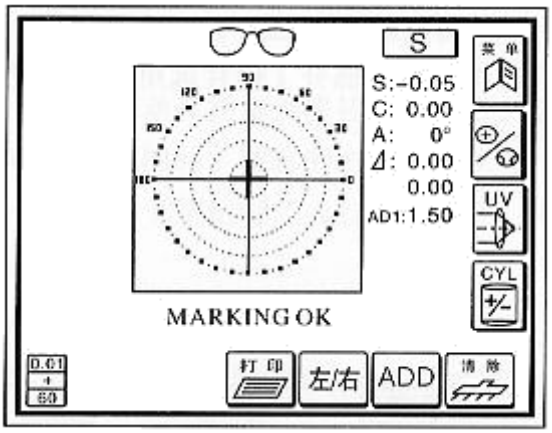


Fig. 9 the display after the ADD part for double key is pressed for double beam lens

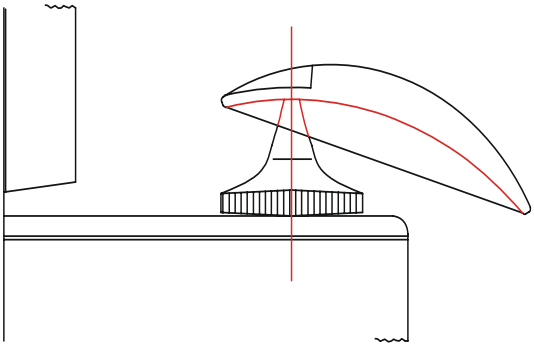


Fig. 10 installation of the myopic part for double beam lens

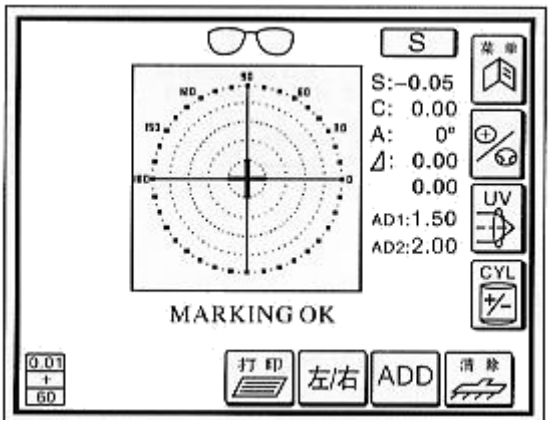


Fig. 11 the display of measure results for double beam lens

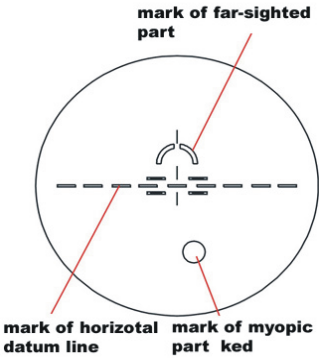


Fig. 12 the mark of progressive multi-focus lens

D.Check the uncut progressive multi-focus lens

Both of the far-sighted and myopic parts of uncut progressive multi-focus lens are marked (Fig.12). Measure the parts according to the marks

1. Check by the Test Screen.

a) press “ADD” key to enter into Progessive Screen.(Fig.13)

b) Put the convexity upward and myopic parts towards inside, keep the datum line horizontal and put the lens on the bracket, then fix it. Make the far-sighted optical center focused on the optical enter of the instrument, record and save the value

If the hint voice items of the automatic options are selected, then instrument will emit “beep” when far-sighted optical center focus, the parameters is confirmed and recorded, memory key is unnecessary.

c) Draw the lens outward to make the myopic part close to the optical center of the instrument. The display is showed as Fig. 14. When the optical focus “+” is in the same position with the center line of the lens, while the optical center “+” is close to the lower horizontal line of the lens, two focuses are made together. The hint sound emits and the parameter value ADD of myopic part is displayed. (Fig. 15)

Attention: if the optical center “+” line of the myopic part is in superposition with the upper line of the lens, the optical center “+” line is lower than the bottom horizontal line of the upper lens, the instrument will automatically latch and emit hint voice,. The ADD value is displayed, but the checked point is still in the progressive zone and ADD value is small.

Press the progressive key to return to the Test Screen.

Fig. 13. Progressive Screen

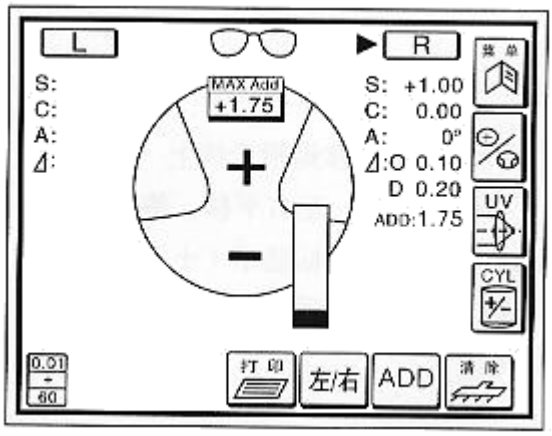


Fig. 14 Test finished for far-sighted part of progressive Test is finished

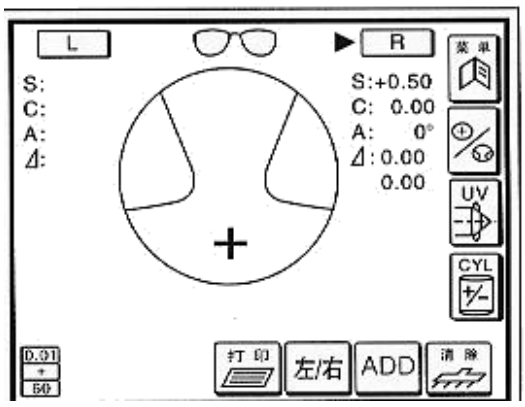


Fig. 15 Progressive view zone when the Test is finished

E. **Check progressive multi-focus lens with framework**

Check with progressive Screen. Operation must be careful because of no mark on the lens.

a) Put the lens with framework in the same way .
b) Measure parameters of far-sighted part first. The center of far-sighted part is in the scope close to the framework center. Do the same way .
c) Measure parameters of myopic part.

   Move the lens outward by handle and baffle. Move the framework between left and right along the direction near the framework center and myopic part optical center to look for the optical center of myopic part. The optical center "+" of myopic part may be not able to cross with the mark center of lens, so the max value should be recorded and then press the memory key.

F. Check for high refraction ratio lens

When high refraction ratio lens is measured, please select ABBE value from the menu, which is correspondent to value of the lens. Then enter into the Screen to measure. The operation is finished the displayed parameters have been made some compensation for ABBE values.

1.Test of eyeglass optical center.

a) Select the "memorized" from the auto-memory menu, return to the Test Screen, press the right (or left) eyeglass lens key.
b) Make the eyeglass framework face to the operator and convexity upward, put the nose bridge block lock into the concave position, adjust the lens baffle, make the framework bottom against the baffle and put the right (or left) lens on the bracket.
c) Make the framework always close to the baffle through nose bridge block when move left to right, forward or back by parallel. When the optical centers of lens and instrument in the superposition, the hint

sound “beep” emits. The screen display the parameters of right (or left) lens, at the same time, the right (or left)

d) part horizontal distance value RPD (LPD) from the optical center is showed under the left side (or left) part.

e) Move the nose bridge and framework together right (or left), put the left (or right) eyeglass lens on the bracket, look for the lens optical center following c), when the hint sound stop, the right (or left) part horizontal distance value RPD (LPD) will be displayed under the left side (or left) part, the optical center horizontal distance PD value is showed too.

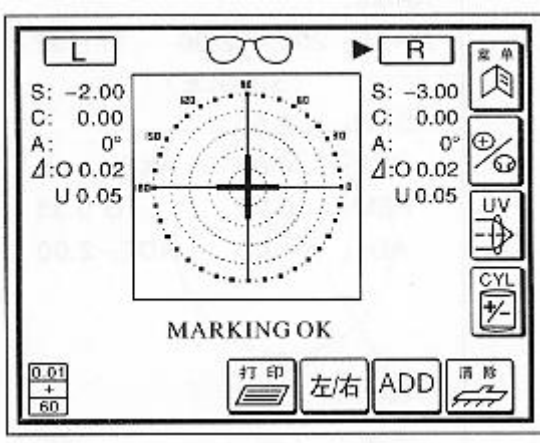


Fig. 16 display of the lens

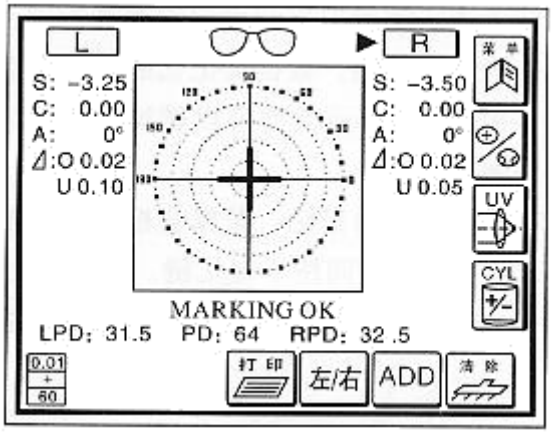


Fig. 17 display of the optical center horizontal distance

2. Print

When print is necessary after the check is finished, press the memory key first, then press the print key the instrument will send out the results from the print on the right side. When do this the option “On” must be held.

Chapter 4 Other Instructions

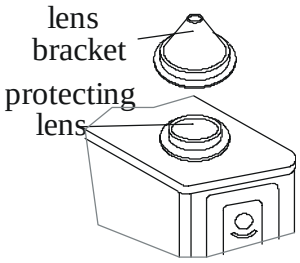
A. Revise

AUTO LENSMETER is afforded with the function for revising the error. When used for long time, error between the check value and real value is intolerable. It can be amended with the standard lens. It is complicate and professional man is required.

B. Maintenance

a) Please prepare a dust-proof cover and cover the instrument when it is free in order to reduce the influence of dust.

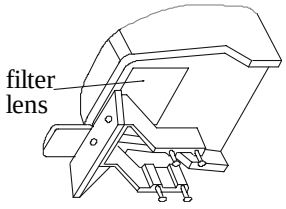
b) Please set screen protection when the instrument is in use, if it is free of test the screen can shut automatically.



c) Clean the protecting lens regularly. Take down the bracket first and clear the dust or oil with soft brush or lens paper.

> **Warning**：Don’t scratch the protecting lens, otherwise the precision will be reduced.

d) Check the filter regularly. Clear it lightly with soft brush or lens paper to get rid of the deposited dust.



> **Warning**：Don’t scratch the filter.

e) Add printer oil

when the sign is dim the printer oil should be added. Draw out the ink

box to the table, open the cover, infuse the ink on the sponge. When work is finished recover the box and get it back.

f) Replace print paper

Resume the paper according to the instruction.

g) Replace fuse

shut down the power before replacement, pull off the power line and take out the outlet under the power socket and replace it. Pay Caution to the fuse type: the required voltage and current.

h) Surface clear

Wipe the surface with soft and dry rag. If the oil is heavy, the neutral wash can be used with the rag. Then dry it with cloth. Warning: organic solvent and gas are forbidden.

C. General faults treatment

General faults of LM-280 AUTO LENSMETER can be treated as follows:

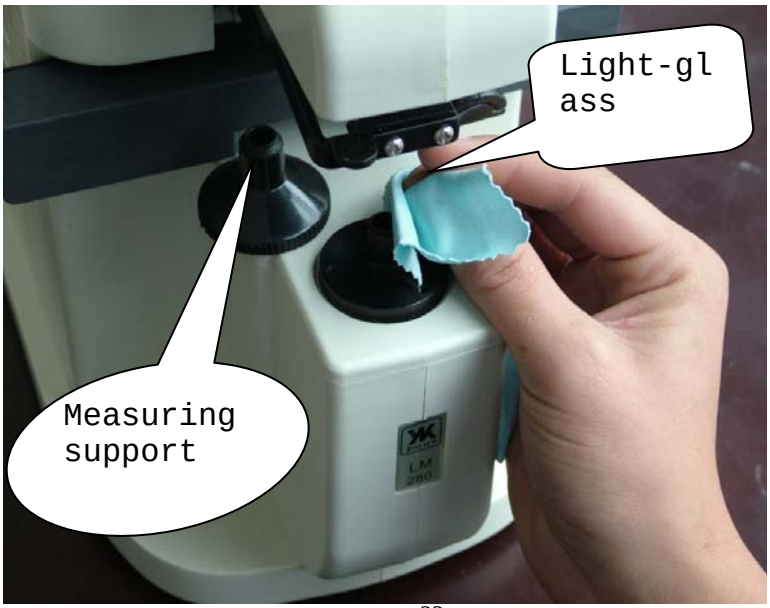
SN	Fault character	Reason	Solution
1	Power indicator lamp doesn't flash	Fuse broken	Replace fuse
2	Display is dim	Lightness is too low	Adjust the lightness
3	Display is blurry	Contrast is too weak	Adjust the contrast
4	Display disappears suddenly	The screen protection works	Press the memory key or Start the screen again
5	Stick at Start Screen	There is lens on the bracket,"INITAI ERROR" is displayed under the Screen	Take out the lens and restart the instrument.
		No lens but still display "INITAI ERROR" too much dust	Clear the bracket and restart the instrument
6	Too intensive circumstance light	No paper or paper is installed incorrectly.	Install or reinstall the paper correctly.

	ADD of ball, column and prism go beyond	The “PRINT” function is off in the menu.	Open the “PRINT” function in the menu.
7	No paper is out when press the print key	Paper run our or not install	Install the paper again
		Printer is not open	Restart the printer
8	Mark on lens is not clear or invisible	Print oil is dry	Add oil

LM280 Series coke-meter calibration data that
In view of the use of this product in the process of measuring data error problem, a special new features calibration measurements. This feature is based on measurement of national production house vertex power of the lens in the standard spherical 0 to ± 20D in lens as the standard for this product data calibration operation.

Note: This product is calibrated before the factory to see the machine code, code to the factory V at the beginning of the machine that has the calibration function.

Important
In the calibration, the machine should be shut down under the lens measuring bearing down, the optical-glass wipe clean, well-being re-measurement of lens support, and then opened machine calibration (the picture shows off the lens measuring sticks Block of optical-glass cleaning)



By the following steps calibration operation:

1. to ensure that light-cleaning glass, open the machine. (The picture shows the normal boot interface)

2. under the light of a map icon, holding down the key blank (about 3 seconds) until the hearing, Di. ... Di continuous sound, the hand can be let go. Into the machine calibration, the screen will show if the interface is shown in Figure 2 into the machine to calibrate the model, when the space bar to do the calibration button to the top of the screen "calibration model" prompt.

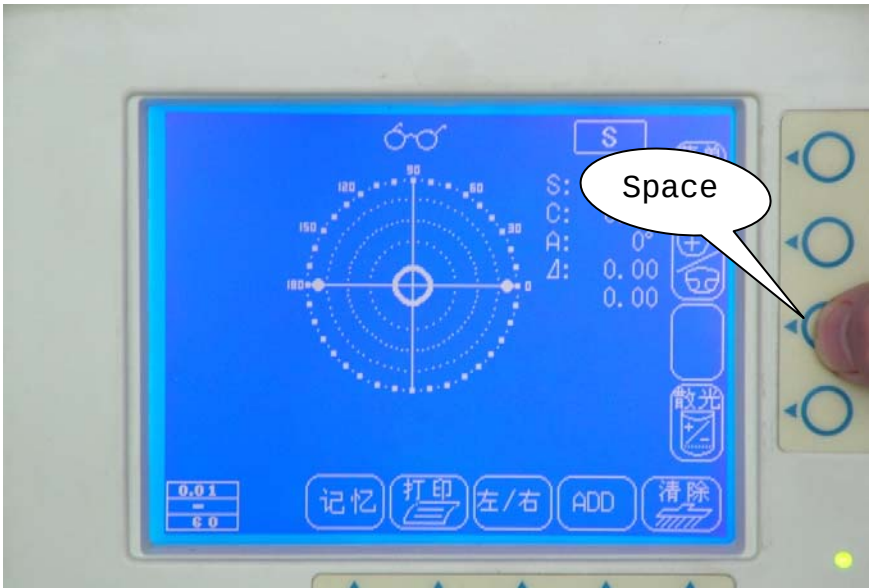


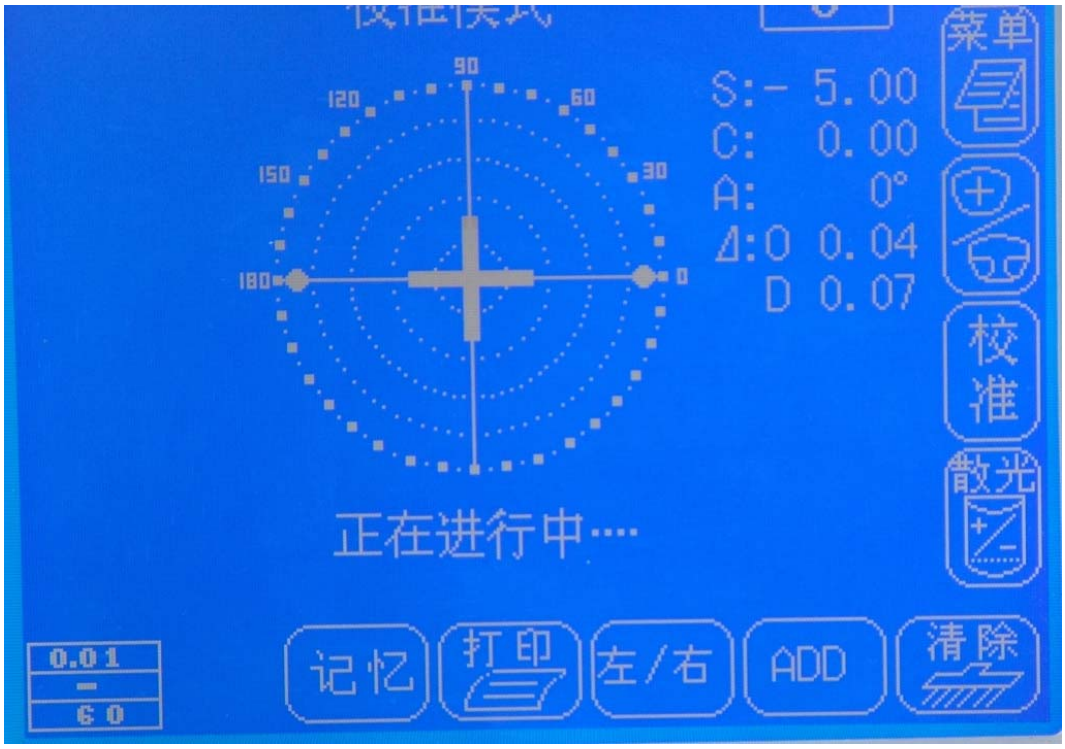
Diagram 1

Diagram 2

3.and then take the standard lens, lens normal measurement, when the target at the center into a rough shape of the cross-line cross (X), such as

that shown in the diagram under the

4.and then click the button calibration, the machine can automatically complete the lens of the current degree of automatic calibration, the calibration process that follows the screen appear as shown in Figure suggest that the current standards that mirror the degree of calibration is in progress.



5.the current standard lens calibration is complete, the screen appears as follows map "has been completed!" Prompt.

Then remove the current standard lenses, said the resumption of the screen interface shown in Figure 2.

6.and then on the need to calibrate the degree lens can be calibrated in order.
7.calibration operation is completed, the machine re-boot, after the calibration of the machine can be used to normal.

Prompts the question:

- calibrated machine, follow the steps carefully calibrated operation.
- If the calibration process to operate properly, there might be death. At this point can only restart the machine.
- After resuming the original calibration has been the lens is no need to re-calibrate again。

When you press the button calibration, the calibration into the state, and do not want to calibration, restart your machine, measuring return to normal status.